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MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP
300 S. WACKER DRIVE
32ND FLOOR
CHICAGO, IL 60606

EXAMINER	
LE, QUANG V	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/561,349	PARKINSON ET AL.	
	Examiner	Art Unit	
	QUANG LE	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☐ Claim(s) _____ is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☐ Claim(s) _____ is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the amendment filed on 6/2/2011.

Claims 1-11 and 13-17 have been examined and are pending. This action is made **Non Final.**

Response to Arguments

2. Applicant's arguments see pages 5-10, filed 6/2/2011, with respect to the rejections of claims 1-11 and 13-14 under 103(a) have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. However, upon further consideration, a new ground(s) of rejection is set forth below.

3. The following changes to the claims are acknowledged:

Claims 1, 16 and 17 were amended by the applicant.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1, 3, 7, 8, 16 and 17** are rejected under 35 U.S.C. 102(b) as being unpatentable over Fox, US 5,926,780.

As per claim 1, Fox teaches an image processing system comprising:

a plurality of linear arrays of detectors **24, 30** imaged onto a scene of interest **500** (Figure 1 and 2, col 5, lines 10-27);

an image store for receiving signals from the plurality of linear arrays of detectors when a detected object passes through the scene (figures 3 and 4, col 5, lines 40-63); *The object is the shadow of the golf ball 500.*

wherein the plurality of linear arrays of detectors **24, 30** are spaced substantially parallel to one another to image a plurality of areas of interest in a scene (figure 1 and col 19-23, "Second light sensing array 30 is oriented substantially parallel to first light sensing array 24"); and

a signal processor **64** for detecting images received by the plurality of arrays and determining direction and speed of movement detected (col 5, lines 1- 5," a system for measuring the initial velocity vector of a ball in accordance with the present invention, generally designated as 20. The initial velocity vector is comprised of a line of flight consisting of azimuth and elevation components, and an initial speed"). *The line of flight is the direction in the claim.*

As per claim 3, Fox teaches the system of claim 1, Fox further teaches wherein the detectors are visible light sensitive detectors (col 10, lines 59-63).

As per claim 7, Fox teaches the system of claim 1 Fox further discloses wherein each detector array has its output read out sequentially from each detector element (figure 11, col 8, lines 1-25).

As per claim 8, Fox teaches the system of claim 1, Fox further discloses wherein the processor is arranged to determine at least one of detected object range, direction of movement, speed, true direction of travel, object type (Col 7, lines 23-30).

As per claim 16, Fox teaches all the limitations as cited in claim 1. Additionally, Fox also teaches wherein the linear array of detectors are not one or more video cameras (figure 1). *Sensing arrays 24 and 30 are not video camera.*

As per claim 17, Fox teaches all the limitations as cited in claim 1. Additionally, Fox also teaches wherein the linear arrays of detectors are arranged so that the detected object is not imaged simultaneously by each of the plurality of linear arrays of detectors as said detected object passes through the scene (figures 3 and 4*). Due to the space between the two sensor arrays 24 and 30, the shadow of the golf ball is captured (imaged) one at a time (not simultaneously) by the two sensor arrays.*

5. Claims 1, 3, 7, 8 and 13-17 are rejected under 35 U.S.C. 102(b) as being unpatentable over Wojcik, US 4,580,894.

As per claim 1, Wojcik teaches an image processing system comprising:

a plurality of linear arrays of detectors **12 and 14** imaged onto a scene of interest (Figure 1, col 3, line 60 to col 4, line 30," Each of CCD arrays 12 and 14 is a linear array of photoelectric sensors 18");

an image store for receiving signals from the plurality of linear arrays of detectors when a detected object passes through the scene (Figure 1, col 3, line 60 to col 4, line 4);

wherein the plurality of linear arrays of detectors **12 and 14** are spaced substantially parallel to one another to image a plurality of areas of interest in a scene (figure 1); and

a signal processor **64** for detecting images received by the plurality of arrays and determining direction and speed of movement detected (col 11, lines 7-27, "Apparatus 10 normally measures velocity of an image in a direction pointing from the first array 12 to the second array 14. However, the apparatus is provided with switching circuits 74, 82 and 86 so that it can measure image velocity in the opposite direction").

As per claim 3, Wojcik teaches the system of claim 1, Wojcik further teaches wherein the detectors are visible light sensitive detectors (figure 1, col 4, lines 12-13).

As per claim 7, Wojcik teaches the system of claim 1 Wojcik further discloses wherein each detector array has its output read out sequentially from each detector element (col 4, lines 30-47 and figure 2).

As per claim 8, Wojcik teaches the system of claim 1, Wojcik further discloses

wherein the processor is arranged to determine at least one of detected object range, direction of movement, speed, true direction of travel, object type (col 11, lines 7-27, “Apparatus 10 normally measures velocity of an image in a direction pointing from the first array 12 to the second array 14. However, the apparatus is provided with switching circuits 74, 82 and 86 so that it can measure image velocity in the opposite direction”).

As per claim 13, Wojcik teaches the system of claim 1, Wojcik further discloses wherein the linear arrays of detectors are arranged to sequentially image the detected object in said plurality of areas of interest as said detected object passes through the scene (col 2, lines 51-68).

As per claim 14, Wojcik teaches the system of claim 1, Wojcik further discloses wherein the linear arrays are disposed such that as the detected object passes through the scene a component of movement thereof is substantially orthogonal to an alignment direction of said arrays (figure 1, arrow A is object direction which is orthogonal to the alignment to the two linear array sensors 12 and 14).

As per claim 15, Wojcik teaches the system of claim 1, Wojcik further discloses wherein the detected object is imaged consecutively by each of the plurality of linear arrays of detectors as said detected object passes through the scene (col 3, lines 1-30).

As per claim 16, Wojcik teaches all the limitations as cited in claim 1. Additionally, Wojcik also teaches wherein the linear array of detectors are not one or more video cameras (figure 1). *Sensing arrays 12 and 14 are not video camera.*

As per claim 17, Wojcik teaches all the limitations as cited in claim 1. Additionally, Wojcik also teaches wherein the linear arrays of detectors are arranged so that the detected object is not imaged simultaneously by each of the plurality of linear arrays of detectors as said detected object passes through the scene (col 4, lines 30-47*).*

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained through the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claim 11** is rejected under 35 U.S.C. 103(a) as being unpatentable over Fox as applied to claim 1 above, further in view of Vock, US 5,798,519.

Regarding claim 11, Fox teaches the system of claim 1, but it fails to teach wherein outputs from the signal processor are communicated to remote monitoring stations.

However, in an analogous art, Vock teaches a method for measuring golf driving range distance using focal plane array. Vock also teaches the ball target information can be remotely monitored at a remote station (col 15, lines 60-64 and col 19, lines 35-37).

Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to incorporate Vock method of remotely monitoring into Fox measuring system so other users can monitor the speed of the ball at a remote station.

7. **Claims 2 and 4** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wojcik as applied to claim 1 above, further in view of Douglas Burgess, UK Patent Application, GB 2154388.

Regarding claim 2, Wojcik teaches the system of claim 1, Wojcik does not teach the detectors are infra-red detectors.

However, in an analogous art Burgess teaches an image processing system that use single linear array sensors to detect a presence of a vehicle in the scene that uses infra-red detector (col 1, lines 51-52).

Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to incorporate the infra-red detector as taught by Burgess into Wojcik velocity measuring apparatus in order to enhance the detection of the system (Burgess: col 1, lines 55-56)

Regarding claim 4, Wojcik teaches the system of claim 1, Wojcik does not teach wherein the detectors are mm wave detectors.

However, in an analogous art Burgess teaches an image processing system that use single linear array sensors to detect a presence of a vehicle in the scene that uses small wavelength radar detector (Col 1, lines 57-59).

Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to incorporate the small wavelength detector as taught by Burgess into Wojcik velocity measuring apparatus in order to enhance the detection of the system (Burgess: col 1, lines 55-56).

8. Claims 5, 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wojcik as applied to claim 1 above, in view of Mazumder, US 4,484,068.

As per claim 5, Wojcik teaches the system of claim 1, Wojcik does not explicitly disclose wherein each detector element in each linear array has associated therewith an independent noise limiting means.

However, Mazumder teaches bar code processing apparatus that has an array of linear sensors 44 (figure 2). Each sensor has an associated filter to block out unwanted noise (figure 4, col 2, line 54 to col 3 line 7).

Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made for Wojcik to implement the noise filter as taught by Mazumder into the sensors in the linear array 12 and 14 in order to block out the unwanted noise (Mazumder col 3, lines 1-2)

As per claim 6, Wojcik in view of Mazumder teaches the system of claim 5, it further discloses wherein the noise limiting means at each detector element comprises an independent amplifier and filter (figure 4, col 2, line 54 to col 3 line 7).

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wojcik as applied to claim 1 above, in view of Rudish, US 6,104,346.

As per claim 10, Wojcik teaches the system of claim 1, Wojcik does not explicitly disclose wherein several systems are combined into a single unit arranged to give about 360° of azimuthal coverage (col 16, lines 39-53).

However, Rudish teaches circular interferometers that include a plurality of vertically oriented linear array interferometers for determining the elevation of the input signal. The antenna elements are omnidirectional in azimuth and allow 360 degree

coverage (Col 1, line 64 to col 2, line 26). The antenna element is a type of sensor to receive signal as the photoelectric sensor in Wojcik system. As such, Rudish teaches a method of positioning the sensors in such a way to have 360 degree of azimuth coverage.

Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made for Wojcik to add additional linear array sensor and arrange in a circular fashion as taught by Rudish so the apparatus can detect and measure velocity of moving object in a surrounding area of 360 degree. This method improves the detecting range of the system.

10. **Claims 1 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Poland, US 6,681,195, in view of Wojcik, US 4,580,894.

As per claim 1, Poland teaches an image processing system comprising:

A *[plurality of linear arrays of]* detector **130** imaged onto a scene of interest **134** (figure 1, 130 is a speed detector).

an image store for receiving signals from the *[plurality of linear arrays of]* detector **130** when a detected object **134** passes through the scene (figure 1 and col 14, line 52 to col 15, line 6);

a signal processor **110** for detecting images received by the [plurality of arrays] sensor 130 and determining direction and speed of movement detected (figure 1 and col 14, line 52 to col 15, line 6).

Poland teaches a compact speed measurement that uses a laser detector to detect the speed of moving vehicle. Poland does not teach the detector is a plurality of linear array, wherein the plurality of linear arrays of detectors is spaced substantially parallel to one another to image a plurality of areas of interest in a scene.

In an analogous art, Wojcik teaches an apparatus for measuring velocity of a moving object that uses a set of linear array as sensors **12 and 14** (Figure 1, col 3, line 60 to col 4, line 30," Each of CCD arrays 12 and 14 is a linear array of photoelectric sensors 18") to measure velocity and direction of a moving object (col 11, lines 7-27, "Apparatus 10 normally measures velocity of an image in a direction pointing from the first array 12 to the second array 14. However, the apparatus is provided with switching circuits 74, 82 and 86 so that it can measure image velocity in the opposite direction"). Wojcik also teaches the plurality of linear arrays of detectors **12 and 14** are spaced substantially parallel to one another to image a plurality of areas of interest in a scene (figure 1).

Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made for Poland to use linear array sensors to detect speed (velocity) of the moving object instead of the radar detector. Since it is well known the art that radar detector is an active device and linear array sensor is a passive device. i.e. radar detector has to emit a signal in order to measure the speed of the moving object and linear array sensor just captures the successive images of the object to compute the speed of the moving object. Such passive speed detector device is more useful for

police radar gun application because it can defeat the radar detectors that rely on the emitted radar signal.

As per claim 9, Poland in view of Wojcik teaches the system of claim 1, Poland further discloses the system including an additional two-dimensional detector array system **140** (camera) which may be switched on when an object is detected (col 14, line 52 to col 15, line 6," If the determined speed is equal to or greater than the capture speed limit, the system coordinator 118 of the processor 110 transmits an operational signal to the camera 140 to trigger the camera 140 to capture an image of the vehicle 134")

Examiner's Note

The Examiner cites particular figures, paragraphs, columns and line numbers in the reference(s), as applied to the claims above. Although the particular citations are representative teachings and are applied to specific limitations within the claims, other passages, internally cited references, and figures may also apply. In preparing a response, it is respectfully requested that the Applicant fully consider the references, in their entirety, as potentially disclosing or teaching all or part of the claimed invention, as well as fully consider the context of the passage as taught by the reference(s) or as disclosed by the Examiner.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang V. Le whose telephone number is (571) 270-5014. The examiner can normally be reached on Monday through Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor David Ometz can be reached on (571)272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Quang Le/
Patent Examiner
Art Unit 2622
/David L. Ometz/
Supervisory Patent Examiner, Art Unit 2622

Fig.7.